



Standard Practice for Preparation of Chromium for Electroplating with Chromium¹

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1. Scope

1.1 This practice is intended to serve as a process guide (not as a standard procedure) for producing adherent electrodeposits of chromium on chromium for engineering use.

1.2 Only well-known, generally practical methods using hexavalent chromium plating baths have been included. Some of the newer proprietary chromium plating processes produce chromium plating for which this process is unsuitable. Suppliers of the processes should be consulted.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

B 177 Guide for Chromium Electroplating on Steel for Engineering Use²

3. Significance and Use

3.1 Electrodeposits of chromium on chromium are produced in cases where it is desired to obtain a better performing coating, to reclaim plated parts that are defective, or restore worn chromium coatings to original dimensions.

4. Preparation of Surface

4.1 *Surface Finishing*—The smoothness of the chromium coating before electroplating with chromium should closely approximate the requirements of the finished part. It is usually achieved by appropriate grinding with a diamond wheel.

4.2 *Stripping and Basis Metal*—With previously electroplated parts where the chromium deposit has been worn through, or where grinding has exposed the basis metal, preferred results are obtained by stripping the remaining chromium completely. However, it is possible to obtain satisfactory deposits on such substrates by careful attention to details in the pretreatment and electroplating process steps.

4.3 Stripping may be done by several methods, including proprietary processes or inhibited hydrochloric acid solution (10 to 20 % by volume), or anodic treatment at 55 to 800 A/m² (5 to 75 A/ft²) in a solution of 35 to 50 g/L (5 to 7 oz/gal) of sodium hydroxide or 60 to 75 g/L (8 to 10 oz/gal) of sodium carbonate at 20 to 25°C (70 to 80°F).

4.4 Process Outline:

4.4.1 Preclean (see 5.1.1 and 5.1.2),

4.4.2 Alkaline electrolytic clean (see 5.1.3),

4.4.3 Rinse (cold water),

4.4.3.1 Rinse (hot water),

4.4.3.2 Dry,

4.4.3.3 Mask (see 5.2),

4.4.4 Activate (see 5.3),

4.4.5 Chromium electroplate,

4.4.6 Rinse (cold water),

4.4.7 Rinse (hot water), and

4.4.8 Dry.

5. Procedure

5.1 *Cleaning*—The following cleaning treatments may be used for all conditions and types of electrodeposited chromium. The choice of the procedures will be governed largely by the condition of the surface.

5.1.1 *Precleaning*—When considerable amounts of grease and oil are present on the surface, precleaning (emulsion or alkaline spray or soak) is necessary to remove the bulk of the soil.

5.1.2 *Abrasive Cleaning*—Oxide and other films may be removed by mechanical techniques using such abrasives as fine emery on a cloth or a wheel, pumice slurry, or greaseless buffing compounds. Grit blasting, shot blasting, wet blasting, or vapor honing may also be used. Abrasive cleaning is generally not necessary when suitable mechanical finishing procedures have been used.

5.1.3 *Cathodic Alkaline Cleaning*—Removal of final traces of dirt, grease, and oil is best accomplished by cathodic alkaline cleaning. Cathodic electrocleaning is necessary because anodic electrocleaning will strip chromium and may expose the basis metal. In cathodic cleaning, the parts are negatively charged and attract positively charged metallic ions, soaps, and other colloidal materials in the solution, causing them to “plate out” as loose smut on the surfaces being cleaned. Thus, do not allow the cleaning solution to become heavily contaminated with dirt, grease, or oil.

¹ This practice is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.02 on Pretreatment.

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² *Annual Book of ASTM Standards*, Vol 02.05.